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APPENDIX V.

[Vide answer to starred question No. 759 asked by Sri V. Sankaran at the meeting of the Legislative Assembly held on 31st October 1958, page 217 supra.]

A.—(*a*) Bentonite is the name applied to a special type of clay. It derives its name from its occurrence in the Benton formation of the Cretaceous age.

Composition.—Bentonite is essentially made up of a mineral known as Montmorillonite ($Al_2 O_3$ $S_1O-\times$ with Fe_2 O_3 and Mgo replacing part of Al_2 O_3).

The latter mineral, to some extent consists of microscopic crystals like that of Kaolinite, but its surface is broad. This larger surface gives to it the peculiar property and its usefulness in commerce. In addition to Montmorillonite, very often bentonite includes fragments of felspar, gypsum, calcium-carbonate quartz, etc.

Physical properties.—Bentonite is usually of greenish yellow colour; but white, grey and black varieties are also known. Unlike ordinary clays the fresh surface of bentonite looks waxy and soapy to the touch. One peculiar property of bentonite is its absorping nature, i.e., the clay takes on its surface liquids or vapours of solids. In this process, the clay tends to swell enormously. Sometimes it swells seven times as much as its volume. There are two types of bentonite though intermediate varieties are also known. One type absorbs very much and swells enormously as stated above. Further, its very fine grains remain suspended in water for a very long time. In the second type, this absorption is not very marked, it is little more than in ordinary plastic clay or in the fullers earth. Further, the fine particles of this type do not remain suspended in water for a long time but settle down fairly soon. These differences are due to the ratio of sodium to calcium in the clays. If there is more of sodium the absorption power will be more and if calcium is more this property is less. However, the second type could be " activated ". This means, that the calcium rich bentonite has to be digested in 25 per cent sulphuric acid, then washed and heated. Now the clay gets " activated ". In fact, calcium containing bentonite is more popular in commerce, especially in petroleum and other oil refining industries than the other type.

Uses.—(1) There are several uses; the major ones are in refining petroleum and vegetable oils to remove the colouring matter. It is also used for the same purpose in fats and greases.

(2) Due to its thinning properties and sealing nature it is used in drilling.

(3) In foundry work bentonite is used as a bonding agent in moulding of sand. In this process both types of clays are used.

(4) To decolourise liquors.

(5) In ceramics, refractories, thermal and acoustical insultations.

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(6) To spray insecticide solutions in horticultural gardens, bentonite is mixed with the solution and used.

(7) In paper and rubber industry, bentonite finds some use. It is used to prevent leakage in earth work and masonry and also in asphalt emulsions.

(8) In laundries, bentonite is used like fullers earth to clean heavily soiled clothes.

(*b*) About Rs. 38 per cwt.

(*c*) All the bentonite clays do not have the same properties each one has therefore to be tested with reference to the particular type of industry in which it has to be employed. Further research has to be made to assess the potentialities of the clay for use in heavy and cottage industries.

(*d*) Bentonite clay is classified as a minor mineral. It is generally quarried as clay and as such no information is available on the annual revenue derived in respect of the mineral.

(*e*) No, Sir.